

Ice Rescue Awareness and Operations
Level Training

Frederick County
DFRS

Course Overview

- The information contained in this presentation is intended to allow personnel to assist in an ice rescue situation. It is not intended to train you to attempt an ice rescue by going “onto the ice”. If you are interested in being trained to the level of ice rescue technician, you need to attend and successfully complete the Ice/Surface Rescue Technician course.

Course Content

- What is the need
- Training levels
- Ice formation/safety
- Ice rescue equipment
- Care for the victim/rescuers
- Ice Rescue Operations
 - Scene set-up

The need











Ice

- When the weather turns cold and ice starts to form many people are attracted to the ice. Animals, both domestic and wild, may also end up in trouble on thin ice.
- These are the reasons for the need for ice rescue training.

TRAINING

❖ There are three Response levels for ice rescue (NFPA 1670):

➤ Awareness level

➤ Operations level

➤ Technician level

Training

❖ AWARENESS LEVEL

- Scene assessment
- Summoning appropriate resources
- Implementing site control and scene management
- Identifying hazards
- Determine rescue vs. recovery

Training

❖ AWARENESS LEVEL

- Scene assessment
 - Number and condition of victim(s)
 - Keep witnesses on scene, separate from others if possible

Training

❖ AWARENESS LEVEL

- Summoning appropriate resources
 - What specific resources are needed to access the victim/site
 - Can aerial apparatus get close enough to be deployed
 - Is the victim submerged – dive resources
 - Can aviation be utilized

Training

❖ AWARENESS LEVEL

- Implementing site control and scene management
 - Keep would be rescuers from going onto the ice

Training

❖ AWARENESS LEVEL

- Identifying hazards
 - Is the ice over moving water
 - Overhead hazards
 - Steep embankments

Training

❖ AWARENESS LEVEL

- Determine rescue vs. recovery
 - Is the victim's head above the water
 - Does the victim respond to verbal directions
 - How long has the victim been in the water
 - How long has the victim been under the water

TRAINING

❖ OPERATIONS LEVEL

- Operations level ice rescue is shore based and utilizes reaching or throwing techniques to recover victims.
- The reach and throw techniques for ice rescue are very similar to those used for static and swift water rescue.

TRAINING

❖ TECHNICIAN LEVEL

- Technician level ice rescue basically involves two rescuers donning dry suits and PFD's.
- A tethered rescuer would proceed to the victim's location, secure flotation to the victim, and then be hauled to shore with the victim.

What is safe ice

- Generally ice that is clear and smooth is strongest.
- The following is a short list of things that can cause ice to be weak
 - Water on the ice
 - Snow or rain
 - Temperatures rising and falling
 - Object sticking up through the ice
 - Moving water under the ice

Water on ice



Moving water



Obstructions



Maximum Load Table

■ Ice Thickness

- 2 inches
- 4 inches
- 5 inches
- 8 inches
- 10-12 inches

■ Max Load

- One person
- Group walking
- Snowmobile
- Car
- Light Truck

However

- If someone has gone through the ice YOU SHOULD CONSIDER THE ICE TO BE UNSAFE!!!!
- Do not go out on the ice or let anyone who is not trained and properly equipped to go on the ice.

Ice Rescue Equipment

- ❖ Personal protective equipment
- ❖ Personal Floatation devices
- ❖ Exposure suits
- ❖ Throw bags or rope
- ❖ Inflated Fire Hose
- ❖ Hand tools
- ❖ Ladder
- ❖ Other related equipment

EQUIPMENT

❖ TECHNICIAN PPE

- PPE should be dry suit w/thermal liner & PFD or Ice Rescue suit.
- Rescuers should always plan on being in the water.
- Movement in suits maybe awkward and these suits may leak at the neck seal.

EQUIPMENT

❖ Stokes Basket:

- A plastic Stokes basket or backboard can be tethered or attached to a highline and used as a sled.



EQUIPMENT

- Plastic backboard
 - Will float
 - Aids in lifting the victim onto the ice



PPE

- Rescuers
 - Ice Rescue suits
 - Dry suits with PFD
- Support personnel
 - Flotation
 - Thermal protection

Ice Rescue Suits



Ice Rescue Suits



Ice Rescue Suits

- Generally One size fits all
- Are Coast Approved PFD's
 - Will float a rescuer and the victim
- Have a harness that is part of the suit for attaching tether lines
- Are quickly donned
- Offer thermal protection

Dry suits

- Either scuba or surface dry suits
- Offers limited thermal protection
- Needs to be supplemented with a Coast Approved PFD
- Needs to be supplemented with a harness to attach a tether

Dry suits



Personal Flotation Devices

- If the suit is not rated as a Coast Guard Approved PFD, then one must be worn by the rescuer
- All personnel operating within 10 feet of the waters edge, or on ground that could possibly lead to you ending up on the ice, need to wear a PFD.

Personal Flotation Devices



Thermal protection for support personnel

- Personnel operating in a support role on an ice rescue need to have appropriate thermal protection, in addition to a PFD.
- Most likely you will get wet from handling ropes, assisting rescue personnel into and out of suits, etc. so water resistance gloves and boots should be utilized.
- Structural firefighting gear should be avoided if at all possible!!!!

Well at least they have PFDs



Ice awls

- Ice awls are used for self rescue



Reaching Devices



Throwing Devices



Rowing Devices



Going Devices



Cold Injuries

- Hypothermia
 - Body temperature of 95 degrees or less
 - Caused by increased heat loss
 - Heat loss by
 - Conduction – 25-30 times faster in water
 - Convection – due to air and water movement
 - Radiation – heat loss from head, face, neck, armpits, groin
 - Evaporation

Stages of Hypothermia

- Stage 1 or mild
 - The victim is conscious and alert
 - The patient will be shivering
 - The patient may be able to assist with rescue

Stages of Hypothermia

- Stage 2 or moderate
 - The patient will be conscious but not oriented
 - Shivering stops
 - Fine motor skills deteriorate
 - May not be able to assist with rescue

Stages of Hypothermia

- Stage 2 or moderate
 - The “Umables”
 - Stumbles
 - Mumbles
 - Grumbles

Stages of Hypothermia

- Stage 3 or severe
 - Unconscious
 - Full body muscle rigidity
 - Unable to assist with rescue
 - Vital signs may be difficult to determine
 - LAST STAGE BEFORE DEATH

PATIENT CARE

- ❖ If a victim is not shivering they are likely in at least moderate hypothermia.
- ❖ There have been documented cases of victims being revived after 60 minutes submersion with no detrimental effect.

Hypothermia Patient Care

- Remove the victim from the cold
- Remove the cold from the victim
- This patient must be transported
- Handle the patient gently
- The patient is not dead until they are warmed

Drowning

- Near-drowning
 - Drowning
 - Mammalian Diving Reflex
 - When submerged into cold water the body shunts blood flow to vital organs from the extremities.
 - Factors affecting survival
 - Age
 - Submersion time
 - Health
 - Cleanliness of water
- Water Temperature
Victim's struggle
BLS care

Assisting the rescuer

- Donning the suit
- Rope set up
- Communications
- Hauling the rescuer and victim

Suiting up

- Ensure the rescuer removes all sharp items from their clothing – the suit can go over street clothes
- Try to get the rescuer into a climate controlled environment
- Ensure the suit is on properly
 - All zippers closed completely
 - All flaps closed completely
 - A PFD is on if needed

Rope set up

- Make sure the rope is long enough to reach the victim
- Tie a figure eight at the end of the rope and place a locking carabiner in the loop, then attach to the rescuer's harness
- Tie a figure eight on a bight 6-8 feet from the first figure eight and place a large, non-locking carabiner in this loop

Rope set up



Communications

- Once the rescuer is in the suit, talking and hearing are impaired
- Hand signals are utilized for communications
- When the rescuer signals with a circular motion above their head, the support personnel should pull in a slow, steady manner
- A hand held motionless with the palm facing shore means stop

Operations

- Team members
 - Incident Commander
 - Spotter
 - Primary Rescuer
 - Primary Tender
 - Backup Rescuer
 - Backup Tender

Operations

- SOP/SOG
- Pre-planning
- Mutual Aid
- Scene set up and control

ARRIVAL

❖ INITIAL ON SCENE ACTIONS BY RESPONDERS

- Make a hazard evaluation of the scene, to determine proper action required
- Establish warm zone & restrict access
(warm zone requires PFD & NO Fire Gear)
- Make verbal contact with victim

ARRIVAL

- Establish victim location by spotting
- Attempt to provide flotation device
- Attempt a shore based rescue

VICTIM LOCATION

- ❖ Determining the location of the victim is critical before victim submersion or before ice breaks apart. (Last Point Seen)
- ❖ Usually victim falls through an isolated weak spot. (small area)

VICTIM LOCATION

- ❖ The identity of this spot is critical, once victim submerges (enhance ability to locate).
- ❖ Once victim attempts self rescue or rescuers enter ice this hole may dramatically enlarge and make submersion rescue difficult.

VICTIM LOCATION

❖ Last Point Seen

- Create line of site markers using fixed objects
- Interview witnesses

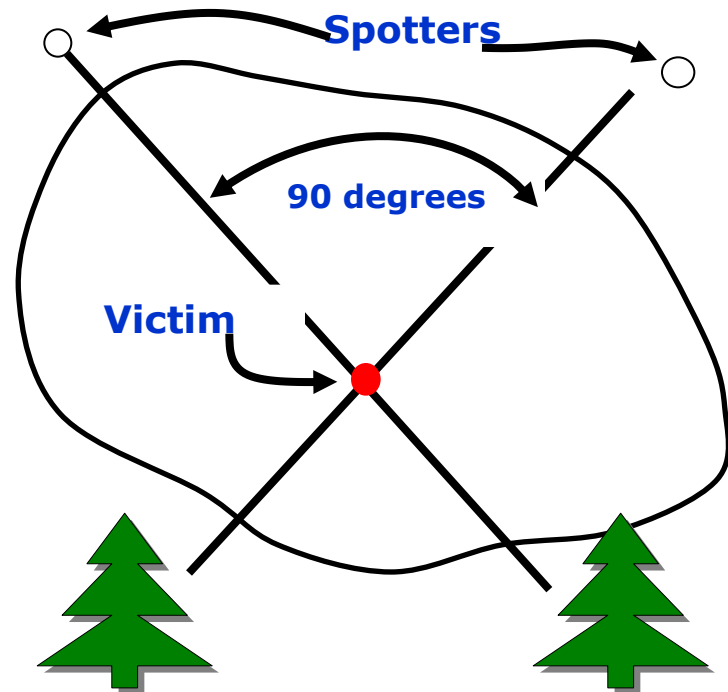
(to improve accuracy interview separately)

- Ask to describe accident from location they observed
- How many victims
- Did anyone make it to shore
- Do they know the victim (name, age, address)

VICTIM LOCATION

- ❖ Make verbal contact with victim.
- ❖ Mark the victims location utilizing shore objects I.E: tree, apparatus etc. before submersion.

- It helps if the spotters make note of something directly behind the victim on the opposite shore.



ZONES

❖ COLD ZONE:

- Area more than 10 feet from the water's edge
- Increased by on scene conditions
- Utilized for Command Post, staging & bystanders

ZONES

❖ WARM ZONE:

- Area within 10 feet of the water's edge
- Increased by a variety of on scene conditions
(steep, slippery slopes near water's edge)
- Warm Zone restricted to participating rescuers

ZONES

❖ HOT ZONE:

- The water is considered the Hot Zone



TACTICS

1. Talk
2. Reach
3. Throw
4. Row
5. Go

TACTICS

1. Talk

- Attempt verbal contact with victim
- Reassure them
- Direct them to attempt a self rescue



TACTICS

2. Reach (Shore based rescue Methods)

- Pike poles
- Ladder
- Inflated hose
- Aerial apparatus





TACTICS

3. Throw (Shore based rescue methods)
 - Rope throw bag- good out to about 75 feet
 - PFD attached to rope

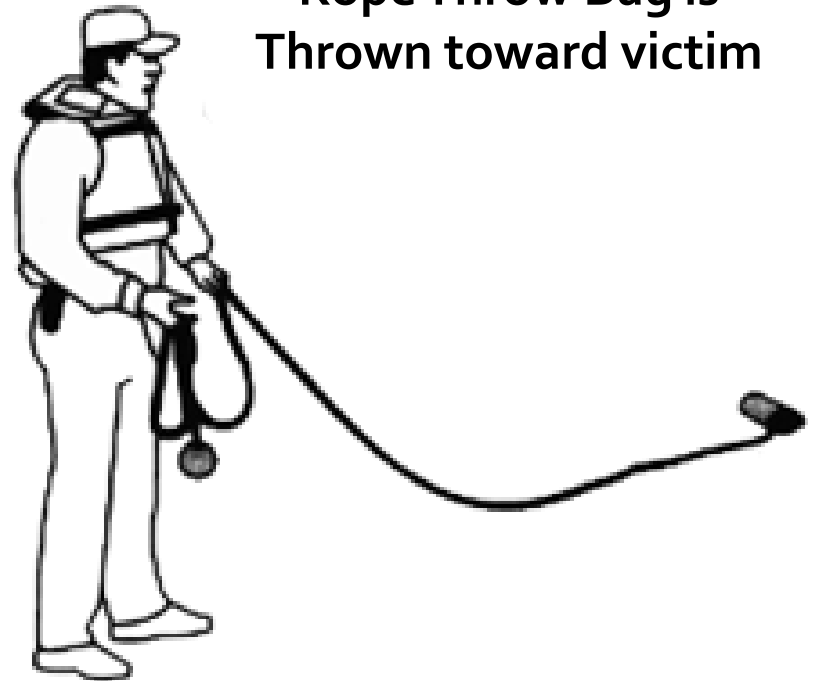
1. While holding knotted end of rope, swing bag backwards and thrown



ROPE THROW BAG

2.

**Rope Throw Bag is
Thrown toward victim**



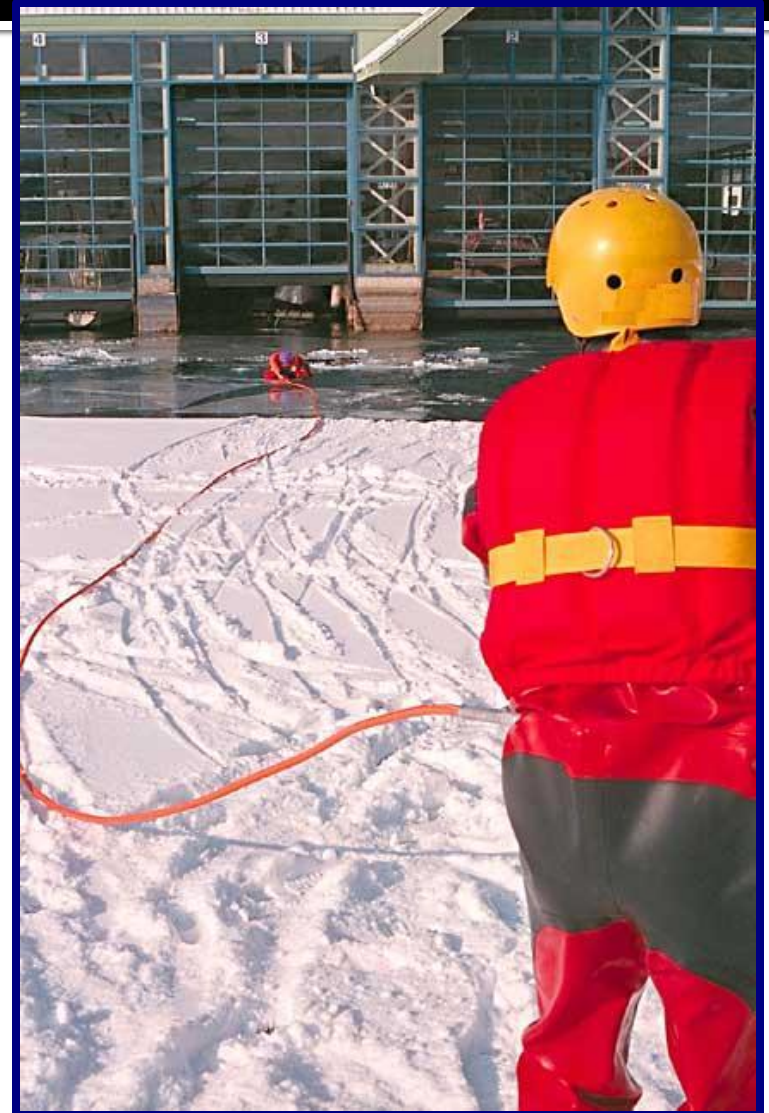
TECHNICIAN TACTICS

4. Row

- If available
- Don't overload
- Use inflatable boats

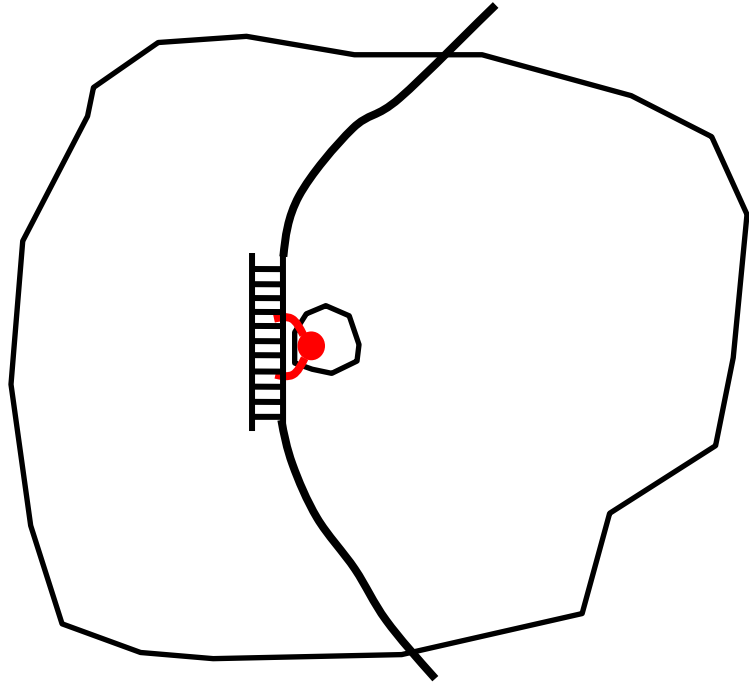


SHORELINE TECHNIQUES



TACTICS

❖ A ladder and ropes can be used to reach extended distances.



TECHNICIAN TACTICS

5. Go

- Preferred method because victim is not expected to assist in rescue

- One person rescue
 - Approach victim from the side or back
 - Wear dry suit or ice rescue suit with tether
 - Keep low center of gravity on ice
 - If in water float on back , paddle with hands
 - Secure victim, using loop method
 - Signal to rescuers on land to begin pulling a shore

TECHNICIAN TACTICS

5. Go



TECHNICIAN TACTICS

❖ MAKING CONTACT WITH VICTIM

The best approach to a victim is from the side or back.

- The ice in front of the victim is likely weak due to the victims attempts of self rescue and will break under your weight.
- If you have a backboard it can be placed along the edge of the hole to spread your weight.

TECHNICIAN TACTICS

❖ MAKING CONTACT WITH VICTIM

- The victim could grab at a rescuer as they approach, but they will likely be too hypothermic.
- If the ice the victim is holding onto in front of them is broken, it is likely they will submerge.
- If attempting a rescue of an animal be aware that they may bite as a fear response.

TECHNICIAN TACTICS

- ❖ Movement on ice should be done by:
 - Crawling
 - Sliding on top of a backboard
 - Sliding while inside a basket litter



TECHNICIAN TACTICS

❖ MOVEMENT ON ICE

- The critical step to movement on the ice is to disperse the rescuers weight is by laying down.
- To enhance movement in this position ice awls or even screwdrivers can be utilized .
- In addition Rescuers can utilize a backboard or some type of litter.

TECHNICIAN TACTICS

❖ RESCUER SETUP

- Each Rescuer entering the ice/water should be attached to a tether.
- There should be a rope for each rescuer and victim combined.
- ❖ Although against normal practice DO NOT lock carabineers.
 - Carabiner threads will freeze and make removal difficult.

TECHNICIAN TACTICS

❖ BREAKING ICE

- Rescuer should hear ice cracking before it breaks. Keep moving and try to stay ahead of breaking ice.

TECHNICIAN TACTICS

❖ If rescuer breaks through ice, use ice awls to pull upper body up on ice, lift legs to the side and onto ice surface. If ice begins to break, quickly roll away from hole and hope ice holds.

HOW TO SURVIVE A FALL THROUGH ICE

Say you're walking across a frozen lake and the ice breaks. What should you do?

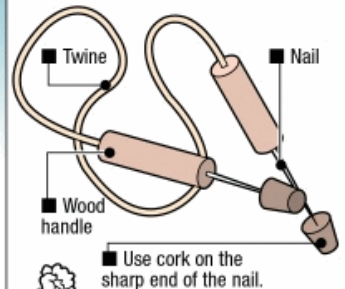
1. The shock of hitting the cold water will be considerable, keep breathing and remain calm. Turn in the direction from which you came. It's probably the area with the strongest ice.

2. Get as much of your body as you can up onto the edge.

3. Do not get out yet. Let as much water as possible drain from your clothing.

4. If you have anything that might help you dig into the surface, use it to grip the ice and pull yourself forward. Some people carry dowels with nails in them for just this eventuality.

SIMPLE ICE SAFETY DEVICE



5. Kick your feet as though you were swimming, and pull yourself up.

6. Once on the ice surface, do not stand up.

7. Stay flat, roll away from the hole and then crawl on your belly until you reach solid ice. This decreases the possibility of your breaking through the ice again.

TECHNICIAN TACTICS

❖ Removal of Victim

- The first method is to remove the victim from the water utilizing a looped rope.



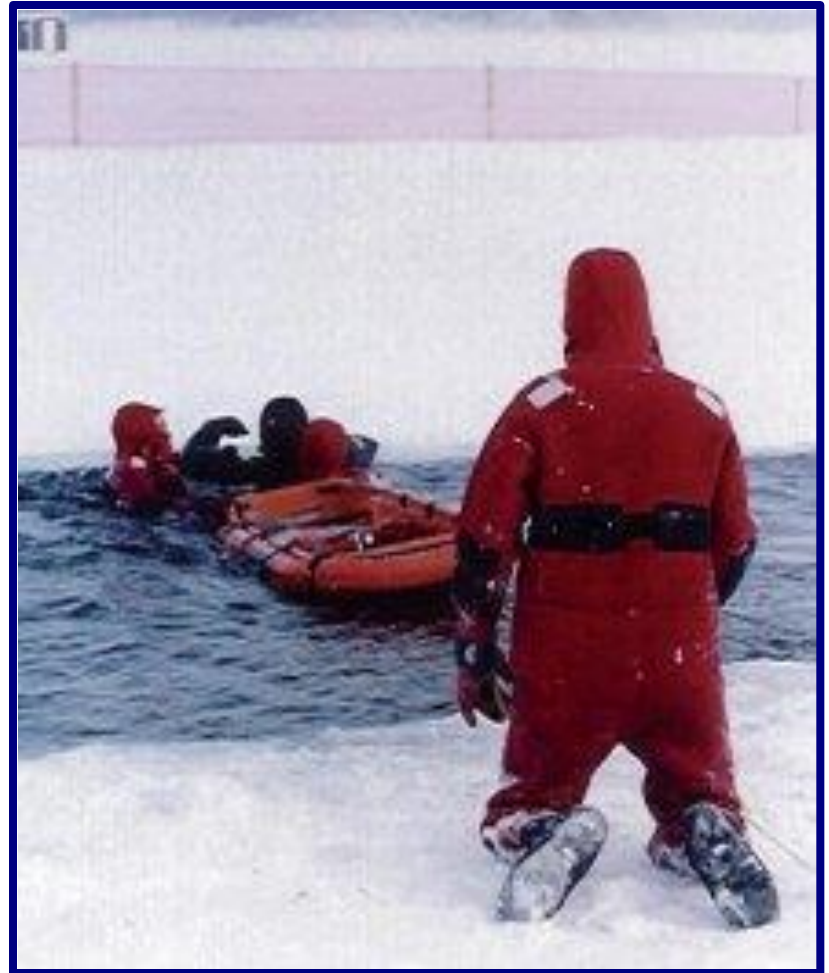
TECHNICIAN TACTICS

- ❖ The second method requires the rescuer to enter the water to assist with victim removal onto the ice surface.



TECHNICIAN TACTICS

- ❖ Stokes basket utilization will enhance victim removal. (slide across ice)



TECHNICIAN TACTICS

- ❖ A plastic backboard can be utilized to assist with floatation and extricating the victim out of the hole onto the ice.



TACTICS

- ❖ Care should be taken when removing victims across icy edges, these edges maybe sharp and can cause injuries.
- ❖ Victim removal to the warm zone can quickly be achieved by sliding the victim over the ice rather than attempting to pull through the water/broken ice.

Summary

- Anytime a rescue is required on ice – THE ICE SHOULD BE CONSIDERED UNSAFE!
- Do not GO OUT on the ice unless properly trained and equipped!
- Secure the scene and keep well-intended bystanders off of the ice. If the ice is broken the victim may become submerged.
- Do not go near the ice without having the proper PPE on!

Summary

- Make every attempt to NOT have personnel using firefighting turn out gear on in the hot zone.
- Any victim that has gone through the ice should be transported for medical evaluation.
- Watch all personnel for signs of cold exposure.
- This course meets the requirements for the Awareness and Operations level.